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A BOG IN CENTRAL ILLINOIS*

BY FRANK C. GATES

At the headwaters of Lake Matanzas, a bayou of the Illinois River in Mason County, Illinois, about forty miles south of Peoria, is situated a bog which the writer visited during July, 1910. The bog is of interest because it is so far south of the usual southern limits of peat-bog plants, as outlined by Transeau.† In it occurs a curious mixture of swamp, bog, and mesophytic plants. The many attempts to separate swamps and bogs by purely physical factors have always virtually proved futile. The plants themselves are the indices and there need be no difference in the environmental factors.

The bog proper is an area, 0.04 of a square mile in extent, in which the soil is a water-soaked muck, imperfectly drained towards Lake Matanzas. The drainage lines are indicated during the summer by small creeks, without open water but hidden by very dense growths of *Leersia oryzoides*. Occasionally a few plants of *Cinna arundinacea* accompany the *Leersia*. This association ends abruptly at the edge of the running water. (Fig. 1.)

The historical factor has the greatest weight in accounting for this bog, for it is known that in times past central Illinois was vegetated by northern plants. Following the retreat of the glaciers this northern vegetation has been displaced by

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† Transeau, E. N. "On the Geographic Distribution and Ecological Relations of the Bog Plant Societies of North America." Bot. Gaz. 36: 401-420. 1903 (with a map).

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prairie and deciduous forest types of vegetation. There still remain, however, isolated spots, under peculiar local conditions, in which the northern plants persist as relics. At Lake Matanzas the bog is located in soggy ground, fed by cold-springs at the base of the bluff, bordering the lake on the eastward. Only a part of the area is occupied by bog plants, at the present time, and the evidence goes to show that swamp plants are gradually displacing them.

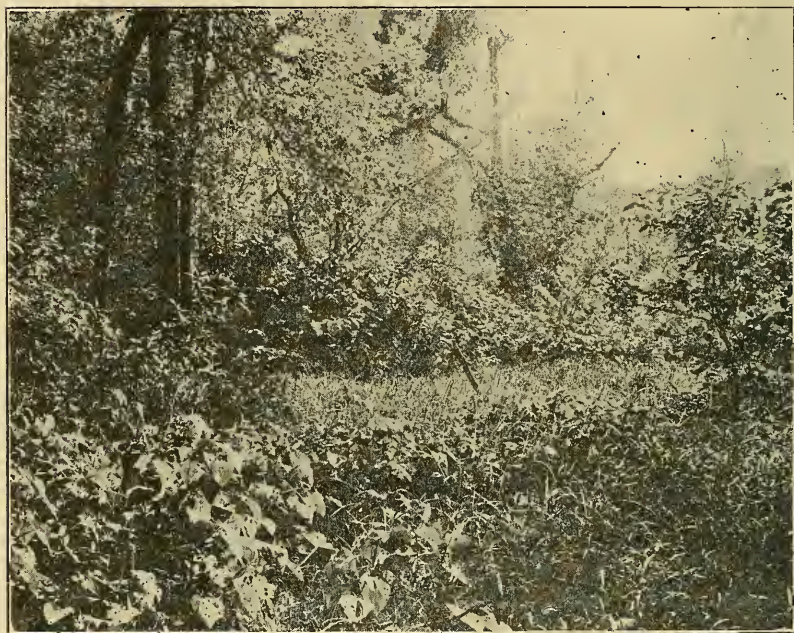


FIG. 1. A portion of the Matanzas Bog, showing a stream course marked by *Leersia oryzoides*, bounded by *Saururus*, back of which are shrubs (*Cephalanthus*) and trees (*Betula nigra*). July 24, 1910.

The ground at the foot of the bluff, kept relatively cold by the water from the springs, is occupied by a luxuriant growth of *Berula erecta*, a northern bog plant. The compound leaves of the first-year plants form a dense mat over a strip about two meters wide from which the flowering stalks of the second year arise. Usually this growth occupies the entire space but not infrequently, especially on the side away from the springs, there

were other low herbaceous plants of which the most abundant were *Mimulus glabratus jamesii*, *Galium trifidum*, *Poa* sp., *Eupatorium perfoliatum* and *Aspidium thelypteris*. Less important species were *Pilea pumila*, *Impatiens biflora*, *Bidens vulgata*, *Scutellaria lateriflora*, *Carex lurida*, *Bidens comosa*, *Veronica scutellata*, *Saururus cernuus*, *Eupatorium* sp., *Oxypolis rigidus*, *Peltandra virginica*, *Rumex Britannica*, *Iris versicolor*, *Sagittaria*

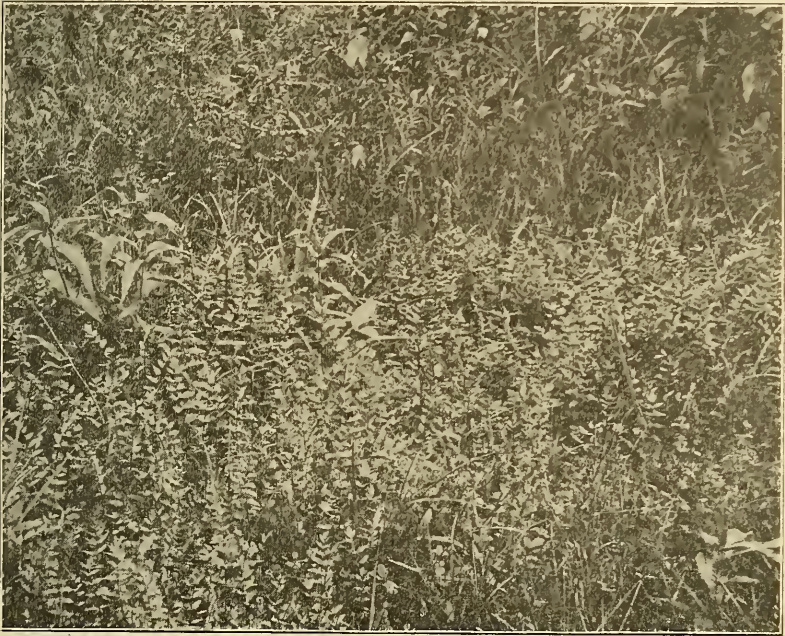


FIG. 2. A portion of the cold-spring area showing *Berula erecta* with *Mimulus glabratus jamesii* and the inroad of swamp plants on the side away from the springs. July 24, 1910.

brevirostra, *Agrostis alba*, *Cicuta bulbifera*, *Boehmeria cylindrica*, *Ranunculus pennsylvanicus*, *Steironema ciliatum* and *Cinna arundinacea*. (Fig. 2.)

In a few places in the *Berula* area there are invading thicket plants which indicate the trend of succession. The thickets are usually formed by *Salix* with *Sambucus* but three were formed by very dense recurring growths of *Decodon verticillatus* about 1.9

meters high. In the center of one of these thickets were plants of *Mentha arvensis canadensis* and *Chelone glabra*, over two meters high, whose exceptionally slender stems were supported by the surrounding *Decodon*.

Bordering the *Berula* association on the side away from the springs and along the creeks just beyond the running water, the *Saururus* association has developed. This association is composed of exceptionally well-developed plants of *Saururus cernuus*, growing somewhat more than a meter high, with large leaves, many long flowering spikes and numerous seeds. With the *Saururus* were virtually no other plants. (Fig. 1.)

Bordering the narrow strip of *Saururus* was a somewhat wider strip of thicket plants, most important of which were *Salix longifolia*, *Cephalanthus occidentalis*, *Cornus amomum* and *Rosa carolina*. In any given spot one of these usually grows to the exclusion of the others, but all of them occupy the same relative position in the vegetation. *Cephalanthus* and *Cornus* occur more abundantly on the springy boggy soil nearer the headwaters of the little creeks, while the *Salix* is very much more abundant nearer Lake Matanzas and along the nearby Illinois river. Thicket plants occur over nearly the entire area but they produce their characteristic appearance only near the creeks, for elsewhere trees are rapidly assuming dominance. Usually the ground is bare of plants and consists of muck together with the debris which the lower sprawling stems of the bushes have sifted from the flood waters of the Illinois river. A sparse growth of herbaceous plants may be present in openings which admit sufficient light to reach the ground. Most important of such species are *Asclepias incarnata*, *Boehmeria cylindrica*, *Peltandra virginica*, *Apios tuberosa*, *Cicuta maculata*, *Iris versicolor*, *Steironema ciliatum*, *Ranunculus abortivus*, *Pilea pumila*, *Eupatorium perfoliatum*, *Lippia lanceolata*, *Verbena hastata*, and in addition, seedlings of *Betula nigra*, *Acer saccharinum*, *Fraxinus nigra* and *Fraxinus americana* may also be present.

The greater part of the bog is covered by the bottomland woods. Although the usual bottomland trees are present, the association does not appear normal as it has not yet become

entirely adjusted to the increase of water level following the establishment of the Chicago Drainage Canal.

The *Platanus occidentalis* association is represented fairly well in the bog area by a number of seedlings in the thickets and along the little creeks, and by a few young trees between the *Cephalanthus* and the *Ulmus-Acer* association. *Platanus* persists quite readily as a relic after the *Ulmus-Acer* association obtains dominance. Both the *Platanus* and the *Ulmus-Acer* associations occupy the drier portions of the bog area and there they readily obtain dominance over the thickets.

The *Ulmus-Acer* association is represented by several of the species of trees which characterize it. The principal ones involved are *Acer saccharinum*, with many, well-developed, medium-sized trees, 2-3 dm. in diameter, furnishing an abundance of seedlings; *Ulmus americana*; *Ulmus racemosa*, with a few small trees, 1.0-1.5 dm. in diameter and several young trees; *Fraxinus nigra*, with a few fair-sized trees and several small ones; *Fraxinus americana*, with several fair-sized and many small trees; *Betula nigra*, with a few medium-sized and several small trees; *Quercus platanooides*, with a few small trees; *Tilia americana*, with a few small trees and one large one; and *Platanus occidentalis*, with a few large relics. Of these the *Acer*, *Betula*, *Ulmus* and *Tilia* incline towards the higher and consequently drier ground, often forming oases in the bog. In such places the shade is very dense and the undergrowth is entirely absent. There is usually considerable undergrowth elsewhere, although but little of it is characteristic of the *Ulmus-Acer* association. This undergrowth is a curious mélange of several species from different associations and formations. In point of numbers the thicket elements are probably best represented with numerous plants of *Cornus amomum*, *Rosa carolina*, *Cephalanthus occidentalis*, *Salix discolor* and *Salix longifolia*. Several young trees are present, notably *Juglans nigra*, *Gleditsia triacanthos*, *Celtis occidentalis*, *Diospyros virginiana* and *Betula nigra*, all of which are characteristic trees in the mesophytic forests of central Illinois. The herbaceous flora includes such a typically northern bog plant as *Spathyema foetida* mixed in with typical swamp plants, as *Asclepias incarnata*, *Spar-*

ganium eurycarpum, *Amsonia tabernaemontana*, and *Impatiens fulva*, meadow and thicket plants as *Onoclea sensibilis* and *Steiromena ciliatum* and mesophytic woodland plants as *Tecoma radicans*, *Laportea canadensis* and *Ranunculus abortivus*. Some of these plants, as *Spathyema*, occur here near their southern limits, while others, as *Amsonia* and *Tecoma*, are at their northern limits.



FIG. 3. A general view of the Matanzas Bog from the bluff, showing the succession from the *Berula* in the foreground, through the shrubs to the trees. July 24, 1910.

Doubtless many other interesting points could be brought out during the spring and fall but the region was investigated only in midsummer.

The presence of *Spathyema* and *Berula* is especially interesting because it is an occurrence of northern plants far south of their normal southern limits of their characteristic associations. They serve as indices to show the character of the former vegetation of central Illinois. That one should find these northern plants

mixed in with southern ones near their northern limits is significant as it demonstrates that vegetation representing different provinces can exist under the same environmental factors.

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TWO SUBMERGED SPECIES OF UROMYCES

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About twenty-five years ago Professor F. L. Scribner, of the U. S. Department of Agriculture, sent samples of several grasses infested with forms of Ustilaginales and Uredinales to Messrs. Ellis and Everhart for study. Among these was a rust on the leaves of *Aristida* from New Mexico which they were unable to refer to any published species and which they therefore described as a new species, *Uromyces Aristidae* Ellis & Ev.* There is throughout the United States east of the Rocky mountains a rather well-known *Uromyces* on species of *Aristida* which has, since the publication of the name by Ellis and Everhart, naturally passed as *U. Aristidae*.

Recently the writer had opportunity to examine the type specimen of *Uromyces Aristidae* Ellis & Ev. which is in the Ellis collection at the New York Botanical Garden and was much surprised to find that it is not at all like the ordinary form which has received that name in most mycological collections. Only uredinia can be found on the type specimen but they are so essentially different from the uredinia of the common *Uromyces*, especially in the presence of paraphyses and in the surface markings of the urediniospores, that there can be no possibility of their belonging to the same species. Since there are no telia on the type specimen it is not even certain that it is a *Uromyces*; it might as well be a *Puccinia* so far as any character present would indicate. Ellis and Everhart doubtless mistook the urediniospores for the teliospores of a *Uromyces*, an error not infrequently made by the earlier mycologists.

Strangely enough among all the specimens of rust on *Aristida* not a one, belonging either to *Uromyces* or *Puccinia*, has been

* Jour. Myc. 3: 56. 1887.